

**PATENT APPLICATION**  
**IN THE UNITED STATES PATENT AND TRADEMARK OFFICE**

In re application of

Docket No: Q63075

Kazunobu FUJIKAWA, et al.

Appln. No.: 09/763,194

Group Art Unit: 3742

Confirmation No.: 3832

Examiner: Maria Alexandra ELVE

Filed: February 20, 2001

For: **METHOD AND APPARATUS FOR SURFACE DISCHARGE PROCESSING , AND AN ELECTRODE FOR SURFACE DISCHARGE PROCESSING**

**RESPONSE UNDER 37 C.F.R. § 1.111**

**MAIL STOP AMENDMENT**

Commissioner for Patents

P.O. Box 1450

Alexandria, VA 22313-1450

Sir:

In response to the Office Action dated July 9, 2008, reconsideration and allowance of the subject application are respectfully requested.

Claims 6 and 8-10 presently are pending in the application. Applicant respectfully submits that the pending claims define patentable subject matter.

As a preliminary matter, Applicant notes that the Examiner has checked boxes 12(a)(3) on the Office Action Summary indicating acknowledgment of a claim for foreign priority under 35 U.S.C. § 119 and receipt of the certified copy of the priority document from the International Bureau. However, there is no foreign priority claim in this National stage application (see Application Transmittal, Declaration and USPTO Official Filing Receipt). Accordingly, the Examiner is respectfully requested acknowledge that the present application does not claim

foreign priority under 35 U.S.C. § 119 and that a foreign priority document has not been received in the next action.

Claims 6 and 8-10 are rejected under 35 U.S.C. § 103(a) as being unpatentable over Inoue (USPN 4,448,655) in view of Bonga (USPN 4,645,894) and newly cited Scarpelli (USPN 3,283,116).<sup>1</sup> Applicant respectfully submits that independent claims 6 and 10 would not have been rendered obvious in view of the Examiner's proposed combination of Inoue, Bonga and Scarpelli.

Independent claim 6 recites in part:

    said wire electrode is composed of a core wire made of ductile material, and a surface discharge processing material made of a surface reforming material or a raw material \_therefore adhered to said core wire, wherein a recess is formed in said core wire, and said surface discharge processing material is adhered to the recess.

Independent claim 10 recites features similar to claim 1.

As noted by the Examiner, Inoue discloses a wire electrode which is formed with a rugged peripheral surface along a length thereof. Inoue teaches various ways of producing the rugged peripheral surface, e.g., forming projections and recesses in a pattern on a cylindrical wire surface by electroless plating, chemical plating, electroplating, spark deposition, powder spraying, plasma-spraying, sintering, sandblasting or knurling; twisting together a group of small diameter wires; winding a small diameter wire on a large diameter core wire; and forming a

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<sup>1</sup> In the previous Office Action, claims 6, 8 and 9 were rejected under 35 U.S.C. § 103(a) as being unpatentable over Inoue in view of Bonga and Inoue '133 (USP 4,506,133) and claim 10 was rejected under 35 U.S.C. § 103(a) as being unpatentable over Inoue in view of Bonga and Inoue '133 or Inoue '489 (USP 3,727,489).

spiral groove in the smooth surface of a wire by means of a rotating die.<sup>2</sup> However, nowhere does Inoue teach or suggest surface discharge processing material is adhered to the rugged peripheral surface (i.e., projections and recesses) of the wire. Instead, Inoue teaches that the smooth peripheral surface of the wire is made rugged by various methods.

In response to the arguments in the October 3, 2007 Amendment that Inoue fails to teach or suggest “a recess is formed in said core wire, and said surface discharge processing material is adhered to the recess”, the Examiner “notes that Inoue disclose the presence of wire electrode recesses, and the use of coatings, such as powder atomization and plasma spraying.” Further, the Examiner asserts that “the discharge material … [is] taught by Scarpelli.”<sup>3</sup> However, Inoue does not teach or suggest that a surface discharge processing material is adhered to recesses of the rugged peripheral surface of the wire electrode. Instead, Inoue simply teaches that the rugged peripheral surface of the wire electrode may be formed by plasma-spraying or powder atomizing.

Scarpelli discloses an electrical discharge machining method and apparatus in which a time interval during which a gap between the cutting tool electrode and the workpiece electrode is conductive is controlled so that current will flow and produce molten particles from the eroded stock of the workpiece electrode. The molten particles are then caused to adhere to the cutting tool electrode surface. The Examiner asserts that “[i]t would have been obvious … to harden the wire electrode surface [of Inoue], using surface discharge as taught by Scarpelli in the Inoue apparatus because of the resulting enhanced tool life.”<sup>4</sup>

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<sup>2</sup> See Inoue ‘655 at FIGs. 3-7; and column 7, line 66 - column 8, line 32.

<sup>3</sup> Office Action at page 6.

<sup>4</sup> Office Action at page 6.

Inoue teaches that the wire electrode is formed with a rugged peripheral surface to facilitate the detachment of gaseous bubbles from the machining surface of the wire electrode. The gaseous bubbles are formed by the electrical decomposition of the machining liquid tend to be adherent on the machining surface of the electrode and thus negatively act as a thermal insulator/barrier between the electrode and the coolant machining liquid. Inoue teaches that by removing the thermal barrier produced by gaseous bubbles which consecutively develop on the electrode surface, the thermal emission and cooling of the electrode surface is enhanced such that the elongated element is capable of carrying greater machining current without undergoing thermal destruction by the heat which develops by the passage of the greater current. The eventual result is a marked increase in removal rate and hence marked shortening of the total machining time required to accomplish a given machining operation.<sup>5</sup>

Accordingly, Inoue in fact teaches away from the modification proposed by the Examiner. In particular, modifying Inoue by adhering a surface discharge processing material in recesses of the rugged peripheral surface of the wire electrode would fill in (flatten) the recesses such that the peripheral surface is no longer rugged (i.e., the surface would tend to become smooth). As a result, the surface of the wire electrode would no longer facilitate the detachment of the gaseous bubbles from the machining surface of the wire electrode. Thus, one of ordinary skill in the art would not have been motivated to modify Inoue based on Scarpelli because doing so would impermissibly change the principle of operation of the Inoue electrode.<sup>6</sup>

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<sup>5</sup> Inoue at Abstract and page 7, lines 11-30.

<sup>6</sup> If the proposed modification or combination of the prior art would change the principle of operation of the prior art invention being modified, then the teachings of the references are not sufficient to render the claims *prima facie* obvious. *In re Ratti*, 270 F.2d 810, 123 USPQ 349 (CCPA 1959)

In view of the above, Applicant respectfully submits that independent claims 6 and 10, as well as dependent claims 8 and 9, should be allowable over Inoue, Bonga and Scarpelli.

Reconsideration and allowance of this application are now believed to be in order, and such actions are hereby solicited. If any points remain in issue which the Examiner feels may be best resolved through a personal or telephone interview, the Examiner is kindly requested to contact the undersigned at the telephone number listed below.

The USPTO is directed and authorized to charge all required fees, except for the Issue Fee and the Publication Fee, to Deposit Account No. 19-4880. Please also credit any overpayments to said Deposit Account.

Respectfully submitted,

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